**PROTOCOL SUMMARY**

**M**ultimorbidity and **Know**ledge Architectures: An Interdisciplinary Global Health Collaboration **(KnowM)**

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**Background.** As people live longer, the coexistence of multiple conditions in one individual – 'multimorbidity' – becomes more common. This is evident in low- and middle-income countries (LMICs), where persisting communicable diseases increasingly intersect noxiously with rising burdens of non-communicable diseases (NCDs). With the need to address multimorbidity increasingly evident, scholars have observed that research, training and care systems remain organised along single-disease and -organ-system lines. Fragmentation of efforts is especially pronounced in LMICs, where global health science and interventions are generally disease- specific and biased towards acute, communicable conditions. There is need for bold new approaches to reconfigure heath systems and indeed the very way we think about disease to respond to the impending threat of multimorbidity.

**Purpose and rationale**. Medical anthropology is a discipline with strengths in broadening conceptual horizons by asking challenging questions and gathering together a broad range of perspectives to rethink health and disease. Anthropologists have already begun to advance our understandings of multimorbidity, notably by introducing the ‘syndemic’ framework which posits that diseases interact synergistically because of social factors such as poverty and inequality. Most anthropological work to date has tended to foreground the complex lived realities of patients and providers; however, deeper anatomical, bounded conceptions of disease within what we call the ‘knowledge architectures’ of medicine and global health remain unchallenged. Leveraging the strengths of medical anthropology, this study seeks to investigate whether the emerging field of multimorbidity is truly challenging prevailing knowledge architectures; and to work collaboratively with people from different disciplines, fields and perspectives to galvanise a transformative, interdisciplinary response.

**Aim:** To co-produce a conceptual framework and formative agenda for responding to multimorbidity in Zimbabwe and other low-resource settings.

**Objectives:**

1. To understand how global health practitioners are framing and responding to the challenge of ‘multimorbidity’, particularly as it relates to the African context;
2. To understand experiences, understandings and challenges of responding to multimorbidity in Zimbabwe from the perspectives of different patients, health professionals, researchers and policymakers;
3. To hold a series of interdisciplinary workshops to consider case studies and findings, to compare and analyse concepts, and to identify pathways towards more holistic, integrated and equitable responses to multimorbidity.

**Study Design.** The proposed study will use a participatory ethnographic research design using methods drawn from medical anthropology. Primary data collection will take place in Zimbabwe over a period of 18 months. Methods include a health facility survey, audio-visual diaries, participant-observation and interviews) and collaborative workshops.

***Site Selection and Participants.*** In Zimbabwe, primary will take places in policy, research, training, care and community settings in Zimbabwe. Work in Zimbabwe will take place in five provinces – Harare, Bulawayo, Mashonaland East, and Matabeleland South (Figure 1). The participants we seek to include in this study are: healthcare facility representatives in Zimbabwe (for once-off survey) (approx. 30); a range of healthcare professionals, public health practitioners, educators, researchers and policymakers across Zimbabwe’s health sector (approx. 50); people living with multimorbidities (PLWMM) in Zimbabwe (approx. 30) (total n = approx. 160); and workshop participants (approx. 50) (many of whom will have been involved in prior study activities). Participants will be enrolled through purposive and snowball sampling techniques, due to the need for a very specific range of perspectives to address our objectives.

A map of zimbabwe with black text

Description automatically generated

**Figure 1. Provinces included in the KnowM study**

***Health Facility Survey.*** Research in Zimbabwe will commence with a health facility survey in selected facilities across Zimbabwe. The purpose of this survey to provide a broad, formative understanding of the country’s health system preparedness for addressing NCDs and multimorbidity. We will sample approximately 30-50 healthcare facilities across the four included provinces, which includes primary, secondary, tertiary and quaternary facilities. Facilities from secondary level upwards will be purposively selected to include a range of provider types and patient population demographics. Primary facilities then will be randomly selected from within the catchment areas of included hospitals.

***Fieldwork in health, research and policy settings.*** To provide a deeper understanding of the challenges of responding to multimorbidity in Zimbabwe, we will conduct participant-observation and in-depth interviews with healthcare professionals (n = 30) and researchers, policymakers, educators and public health practitioners (n = 20). These individuals will be purposively and snowball sampled from healthcare facilities included in the survey and through research and policy networks in Zimbabwe. First, participant-observation will be conducted with participants’ during their day-to-day routines over a period of 3–5 days. Timeframes will be arranged such that routine service delivery is observed but not interrupted. Following participant-observation, participants will be invited to take part in an in-depth interview. During interviews we will ask about their training and education; their work lives and routines, their understandings of multimorbidity and the challenge it poses; and how COVID-19 is inflecting responses to multimorbidity. Interviews may be repeated over time with the same participant.

***Ethnographic research with patients/families/carers.*** We will include approximately 30 PLWMM in Zimbabwe. These individuals will be purposively sampled from facilities in which we are concurrently conducting ethnographic research. Participants will first be asked to record a diary of their day-to-day routines over the course of approximately 2 weeks. This will either be written or, if the participant is consenting, an audio-visual diary. Where appropriate, family members/carers will be invited to take part, both as film makers and as participants. Participants will be also invited to take part in an in-depth interview. During interviews, participants will be asked about daily life and priorities, their experiences and understandings their multiple conditions, and about health seeking. Events recorded by the diary will be specifically asked about. Participants will also be asked how the management of their conditions could be improved. Interviews will typically last between 60-90 minutes.

***Collaborative workshops.*** The final research activity involves a series of collaborative workshops that will build on the earlier research activities. We anticipate holding two day-long workshops in total, each of which will involve approx. 25-30 participants, most of whom will have been involved in previous research activities. The purpose of the workshops will be to collaboratively reflect upon data primary data collected during the study and to iteratively work towards the proposed conceptual framework and research strengthening agenda.

**Access and Permissions.** To gain access to potential participants and ensure the legitimacy of the study, before commencing research activities we will approach the appropriate healthcare institutions in Zimbabwe. Institutional ethical approval will be sought through JREC. Approval to work in healthcare and community settings will further be sought through the appropriate structures at provincial, district, facility and community level in all provinces. Once approvals have been obtained, we will liaise with District Medical Officers, facility managers, clinical directors and community liaisons before approaching individual participants. We will further work closely with the Organisation for Public Interventions and Development (OPHID) to obtain approvals in OPHID-supported provinces (Bulawayo and Matabeleland South).

**Data Management and Analysis.** All raw data will be stored in password protected files and folders. At the end of the project, data that can be anonymised fully to protect participants’ identities will be archived through the UK Data Service (UKDS), with access granted to bona fide users based on a case-by-case request and approval process. All data sources will be entered into NVivo 14 qualitative data analysis software for analysis. Data will be analysed using conceptual framework analysis, a form of grounded theory that is designed to build conceptual frameworks for multidisciplinary phenomena linked to different bodies of knowledge, as this study seeks to do. Conceptual framework analysis will be performed on an ongoing, iterative basis spanning the length of the project that overlaps with, and is fed back into, the ongoing collection of data.

**Dissemination of results.** The collaborative approach taken in this study deliberatively blurs lines between ‘participant’, ‘collaborator’ and ‘user’. Among the key users collaborating in this research are academics, policymakers and health planners who in positions of influence to channel outputs into policy, research and care. Beyond the immediate scope of the collaborative design, the research will be disseminated through several channels, including targeted dissemination meetings for research participants, regular feedback throughout the project to the Ministry of Health and Child Care and a final virtual symposium.

**Ethical Considerations.** Local IRB approvals will be sort and all ethical considerations will be adhered to including obtaining informed consent, maintaining privacy and confidentiality as well as ensuring that no harm befalls any study participants as a result of the study.

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| **KnowM Timeline** | 2022 | | | | 2023 | | | | 2024 | |
|  | JFM | AMJ | JAS | OND | JFM | AMJ | JAS | OND | JFM | AMJ |
| Phase 1: Fieldwork Preparation |  |  |  |  |  |  |  |  |  |  |
| Stakeholder engagement |  |  |  |  |  |  |  |  |  |  |
| Training research assistant |  |  |  |  |  |  |  |  |  |  |
| Ethical approval for Zimbabwe |  |  |  |  |  |  |  |  |  |  |
| Access and permissions |  |  |  |  |  |  |  |  |  |  |
| Phase 2: Primary data collection |  |  |  |  |  |  |  |  |  |  |
| Health facility survey |  |  |  |  |  |  |  |  |  |  |
| Ethnographic fieldwork |  |  |  |  |  |  |  |  |  |  |
| Collaborative workshops |  |  |  |  |  |  |  |  |  |  |
| Phase 3: Analysis and Dissemination |  |  |  |  |  |  |  |  |  |  |
| Production of patient case studies |  |  |  |  |  |  |  |  |  |  |
| Analysis of all other primary data |  |  |  |  |  |  |  |  |  |  |
| Final report |  |  |  |  |  |  |  |  |  |  |
| Virtual symposium |  |  |  |  |  |  |  |  |  |  |
| Produce dissemination materials |  |  |  |  |  |  |  |  |  |  |
| Dissemination dialogues |  |  |  |  |  |  |  |  |  |  |
| Write up findings for publication |  |  |  |  |  |  |  |  |  |  |